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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|-----------------------------|---------------------|------------------|
| 10/596,880 | 06/28/2006 | Hirokazu Kanekiyo | 60303.60/ok | 1683 |
| 54070 7590 06/08/2010 HITACHI METALS, LTD. C/O KEATING & BENNETT, LLP 1800 Alexander Bell Drive SUITE 200 Reston, VA 20191 | | | | |
| EXAMINER SHEEHAN, JOHN P | | | | |
| ART UNIT 1793 | | PAPER NUMBER | | |
| NOTIFICATION DATE 06/08/2010 | | DELIVERY MODE ELECTRONIC | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/596,880

Applicant(s)

KANEKIYO ET AL.

Examiner

John P. Sheehan

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 5 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The Examiner has approved the substitute specification filed June 28, 2007 for entry.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 5 and 9 to 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanekiyo et al. (Kanekiyo '124, US Patent No. 6,706,124, cited in the IDS submitted June 28, 2006).

Kanekiyo '124 teaches a iron based rare earth magnet having a composition that, with the exception of the Q content, overlaps the alloy composition recited in the instant claims (column 2, lines 55 to 65), wherein the hard magnetic phase ($R_2Fe_{14}B$ phase) has a size of greater than 10 nm and equal or less than 200 nm and α -Fe has an average size of 1 to less than 100 nm (column 2, line 66 to column 3, line 2). These size ranges of the $R_2Fe_{14}B$ phase and the α -Fe phase taught by Kanekiyo '124 overlap the ranges recited in applicants' claims 1, 2, 10, 11 and 12 and the size ratio recited in applicants' claim 1. Regarding the Q content, Kanekiyo '124 teaches that x, the Q

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subscript, has a value of 10 at% < x < 20 at% while the instant claims recite that x is 5 at% < x < 10 at%. The instant claims, recite an upper limit of equal to 10 at% while Kanekiyo teaches a lower limit of greater than 10 at%. Thus, the Q content of the claims and Kanekiyo '124 do not overlap but rather closely approximated each other at 10 at%, applicants' claims encompassing an upper limit of 10% and Kanekiyo '124 having a lower limit of greater than 10%. Kanekiyo '124 teaches that the disclosed iron based rare earth alloy can be used to make bonded magnets as recited in applicants' claim 9 (column 3, lines 38 to 41). Kanekiyo '124 teaches that the disclosed iron based rare earth alloy possesses a coercivity of 480 kA/m or more and a magnetic remanence of 0.85 or more which overlaps the coercivity and magnetic remanence recited in the last 2 lines of applicants' claim 1 (column 2, lines 48 to 52 and Table 6, Examples 21, 22 and 24). As shown in the table below Kanekiyo '124 also teaches applicants' disclosed method of making applicants' claimed iron based rare earth alloy.

| | Applicants' Disclosed Method | Kanekiyo '124 Disclosed Method |
|-----------------------------|--|--|
| Cooling Rate | 1×10^4 to 1×10^5 °C/S <u>preferably 1×10^4 to 1×10^5 °C/S</u> (page 27, paragraph [0027]) | 1×10^4 to 1×10^5 °C/S <u>preferably 1×10^4 to 1×10^5 °C/S</u> (column 15, lines 49 to 52) |
| Cooling Wheel Speed | 10 m/s to 30 m/s (page 29, paragraph [0061]) | 10 m/s to 30 m/s (column 16, lines 6 and 7) |
| Heat Treatment Heating Rate | 5 °C/s to 20 °C/s (page 30, paragraph [0062]) | 5 °C/s to 20 °C/s (column 16, lines 40 to 45) |
| Heat Treatment Temperature | 550 °C to 850 °C (page 39, paragraph [0062]) | 550 °C to 850 °C (column 16, lines 40 to 45) |
| Heat Treatment Time | 30 seconds to 20 minutes (page 30, paragraph [0062]) | 30 seconds to 20 minutes (column 16, lines 40 to 45) |

The claims and Kanekiyo '124 differ in that Kanekiyo '124 does not teach the exact same alloy proportions as recited in the instant claims, the Q contents do not overlap but rather closely approximate each other at 10 at% and Kanekiyo '124 is silent with respect to the thickness of the $R_2Fe_{14}B$ phase thickness as recited in claim 1, line 21 and claim 10, line 28.

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because, with the exception of the Q content, the iron based rare earth alloy proportions taught by Kanekiyo '124 overlap the instantly claimed proportions and therefore are considered to establish a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

"The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05(II) A.

Regarding the Q content of the claims versus the Q content taught by Kanekiyo '124, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because Kanekiyo '124's lower limit of greater than 10 % for the Q content and the instantly claimed upper limit of equal to

10% are very similar and closely approximate each other, therefore one of ordinary skill in the art would have expected Kanekiyo '124's alloy and the instantly claimed alloy to have the same properties. See *in re Peterson*, 65 USPQ2d 1379, 1382, citing *Titanium Metals Corp. v. Banner*, 227 USPQ 773, 779 and MPEP 2144.05 I.

“a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of “having 0.8%nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium” as obvious over a reference disclosing alloys of 0.75%nickel, 0.25% molybdenum, balance titanium and 0.94%nickel, 0.31% molybdenum, balance titanium.).

Regarding the $R_2Fe_{14}B$ phase thickness, one of ordinary skill in the art at the time the invention was made would have expected the $R_2Fe_{14}B$ phase thickness of Kanekiyo '124's iron based rare earth alloy to be the same as recited in applicants' claims because Kanekiyo '124's iron based rare earth alloy has a composition that, with the exception of the Q content which closely approximates the claimed Q content, overlaps the iron based rare earth alloy recited in the instant claims and is made by a process which is similar to, if not the same as, applicants' process of making the instantly claimed alloy (see the table above). In view of this, the alloy taught by the reference would be expected to possess all the same properties as recited in the instant claims including the thickness of the $R_2Fe_{14}B$ phase, *In re Best*, 195 USPQ, 430 and MPEP 2112.01.

“Where the claimed and prior art products are identical

or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.' In re Spada, 15 USPQ2d 655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best, 195 USPQ 430, 433 (CCPA 1977)." (emphasis added by the Examiner) see MPEP 2112.01.

Response to Arguments

4. Applicant's arguments filed March 15, 2010 have been fully considered but they are not persuasive.
5. Applicants' argument that Kanekiyo '124's nanocomposite magnets include borides, such as Fe_3B , $\text{Fe}_{3.5}\text{B}$ and Fe_{23}B_6 and do not include or require $\alpha\text{-Fe}$ phase is not persuasive. Applicants' use of the term "includes" (for example claim 1, line 13) to describe the crystal structure of the claimed nanocomposite magnet does not preclude the presence of borides, such as Fe_3B , $\text{Fe}_{3.5}\text{B}$ and Fe_{23}B_6 taught by Kanekiyo '124.

The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Mars Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1376, 71 USPQ2d 1837, 1843 (Fed. Cir. 2004)

MPEP 2111.03

Further, Kanekiyo '124 does teach the presence of $\alpha\text{-Fe}$ phase (for example, see Kanekiyo '124's claim 3 and column 3, lines 10 to 11).

6. Applicants' argument that the Q content taught by Kanekiyo '124 and the Q content recited in the instant claims do not overlap is not persuasive. Kanekiyo '124 teaches that x, the Q subscript, has a value of 10 at% < x < 20 at% while the instant

claims recite that x is $5\text{at}\% < x < 10\text{at}\%$. The instant claims, recite an upper limit of equal to 10at% while Kanekiyo teaches a lower limit of greater than 10 at%. Thus, the Q content of the claims and Kanekiyo '124 do not overlap but rather closely approximated each other at 10 at%, applicants' claims encompassing an upper limit of 10% and Kanekiyo '124 having a lower limit of greater than 10%. In view of this, one of ordinary skill would have considered the invention to have been obvious because Kanekiyo '124's lower limit of greater than 10 % for the Q content and the instantly claimed upper limit of equal to 10% are very similar and closely approximate each other, therefore one of ordinary skill in the art would have expected Kanekiyo '124's alloy and the instantly claimed alloy to have the same properties. See *in re Peterson*, 65 USPQ2d 1379, 1382, citing *Titanium Metals Corp. v. Banner*, 227 USPQ 773, 779 and MPEP 2144.05 I.

"a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8%nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75%nickel, 0.25% molybdenum, balance titanium and 0.94%nickel, 0.31% molybdenum, balance titanium.).

Regarding the Q content, applicants quoting paragraph [0071] of the substitute specification (submitted that June 28, 2007), argue that the claimed Q content of $5 \leq x \leq 10$ is critical or relevant to the enhanced formation of α -Fe phases. The Examiner is not persuaded. Applicants have not provided any evidence in support of their

argument. "It is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification do not suffice." In re Deblauwe, 222 USPQ 191, 196 (Fed. Cir. 1984). Mere lawyer's arguments and conclusory statements in the specification, unsupported by objective evidence, are insufficient to establish unexpected results." In re Wood, Whittaker, Stirling and Ohta, 199 USPQ 137, 140 (CCPA 1978). Applicants' arguments cannot take the place of evidence in the record, MPEP 716.01(c)II.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Sheehan whose telephone number is (571)

272-1249. The examiner can normally be reached on T-F (7:30-5:00) Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John P. Sheehan/
Primary Examiner
Art Unit 1793

JPS